

open wide; the instinct for slaughter is aroused; its sharp fangs close upon the living egg; they rend and tear it, while the hoplisivorous son of Nysson proceeds to devour *Hoplisus* and by its cannibalism becomes sole possessor of the chamber of food.

The remainder of the story is quickly told. The spoils gained by slaughter are soon consumed. A series of moults transforms the usurper from a small larva with sharp, falcate jaws and belly-blisters, to a common grub with broad, blunt, bidentate mandibles, round of abdomen without ambulatory contrivances. When the parasite has eaten its fill, it sets about constructing a cocoon of brown silk and earth, and thus once again betrays its Hoplisoid ancestry, for the cocoon of *Nysson hoplisivora* is indistinguishable from that of *Hoplisus costalis* except by its slightly smaller size.

ENTOMOLOGY.—*Five braconid parasites of the genus Heterospilus.*

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The five new species described below have been received at various times for identification, and the senders are anxious to have names for them so that they can use them in connection with papers dealing with the biology of their hosts. These species add considerably to our knowledge of the habits of the representatives of this genus.

Heterospilus beameri, new species

Female.—Length, 2.75 mm. Frons immediately above the antennae finely aciculate; vertex and posterior orbits shining, practically without sculpture; antenna 23-jointed; scutum and prescutum rather coarsely granular, the prescutum more finely so anteriorly, the median posterior area of the scutum reticulate in addition to the granulations; notauli feebly foveolate anteriorly; the depression in front of the scutellum narrow, without longitudinal rugae; scutellum subopaque, finely tessellated; dorsal carinae of the propodeum well defined but narrow, the lateral-basal areas finely granular; the posterior face of the propodeum not sharply separated from the dorsal aspect, rather finely reticulate, without lateral carinae but with two rather indistinct median carinae which converge below; mesepisternum above the sulcus coarsely granular, below the sulcus tessellated; first tergite granular with two median carinae which bound the raised area and converge posteriorly; second tergite with a U-shaped suture basally and with triangular basal lateral areas defined by sutures, the surface granular except the apical margin; base of the third and fourth tergites feebly punctured, the punctures more widely separated on the fourth; ovipositor subequal in length to the abdomen; second abscissa of radius slightly shorter than the first; stigma angulate at the middle where the radius leaves it. Piceous; the second and fifth joints of antennae and legs below coxae, except last joint of tarsi which is blackish, stramineous; wings hyaline, iridescent, venation pale brown.

Male.—Length, 2.75 mm. The male agrees in sculpture very well with the female except that the first tergite is longitudinally striate in addition to the granulations, the base of the second tergite is longitudinally wrinkled, and the U-shaped area of the second tergite is greatly lengthened so it is almost a truncate V. The third and following tergites are more distinctly sculptured than in the female; the posterior femora are short, robust and broad at the base; antenna 24-jointed; the carinae on the dorsal aspect of the propodeum are feeble; posterior wings without a stigma.

Paratype females indicate variation in the number of antennal joints. In some of them they are 22- and in others they are 25-jointed. Paratype males indicate that the antennae may have only 22 joints. Some male paratypes are only 2 mm. long.

Type locality.—Cherokee County, Kansas.

Described from eleven females (one type) and seventeen males (one allotype) collected June, 1924, by R. H. Beamer, for whom the species is named. In submitting this material Mr. Beamer writes, "They were reared from the eggs of *Cicada*."

Type, allotype and twelve paratypes.—Cat. no. 23973, U. S. N. M. Five female and nine male paratypes returned to the Entomological Collections of the University of Kansas.

This species falls nearest to *languriae* Ashmead, but is readily distinguished from it by the sculpture of the second tergite. The male is one of the unusual forms of the genus, inasmuch as the stigma of the hind wing is wanting.

Heterospilus cephi, new species

Female.—Length, 2.25 mm. Length of ovipositor, 0.5 mm. Head behind the ocelli finely, transversely striate; antenna 27-jointed, the joints poorly differentiated; pronotum not dentate laterally; scutum and prescutum rather coarsely granular; notauli not foveolate, well defined; mesepisternum irregularly wrinkled dorsally with smooth, polished area ventrally; propodeum with the lateral-basal area finely granular, the lateral-dorsal carinae complete, with two diverging carinae dorsally which become obsolete laterally and posteriorly; the posterior face and dorsal surface between the diverging carinae irregularly wrinkled and with an indistinct median carina basally; first tergite sharply carinate laterally, longitudinally striate with the striae slightly irregular medianly; second tergite striato-granular; the base of the third and fourth tergites finely striate; ovipositor one-third as long as the abdomen; first intercubitus obsolete; stigma angulate at the middle where the radius leaves it. Dark ferruginous; antennae, propodeum and first tergite piceous; wings hyaline, strongly iridescent; venation pale brown.

Male.—Length, 2.5 mm. Dorsal part of the head more feebly sculptured than the female; base of the fourth tergite feebly striate; the diverging carinae of the propodeum shorter than in the female and the median carina better defined; the posterior face of the propodeum more distinctly reticulate; antenna 31-jointed.

Type locality.—Ithaca, New York.

Described from three females (one type) and three males (one allotype) recorded under Cornell University Experiment Station No. 1035. The type and allotype reared March 21, 1924; all other paratypes reared February 20, 1924, by D. T. Ries. Mr. Ries in transmitting this material states that the species is a parasite of *Cephus pygmaeus*.

Type, allotype and paratypes.—Cat. no. 27241, U. S. N. M. Paratypes, male and female, returned to Cornell University.

The number of antennal joints varies; as one of the female paratypes has twenty-nine joints in the antenna, and one of the male paratypes has only 26 antennal joints.

This species is apparently most closely allied to *chittendenii* (Ashmead) and *koebeleri* (Riley). In Ashmead's key to the species of this genus it agrees better with *chittendenii* than with *koebeleri*. It may be separated from *chittendenii* by the absence of the lateral carinae on the posterior face of the propodeum and the presence of striae on the base of the third and fourth tergites. From *koebeleri* it may be separated by the longer antennae, the different arrangement of the carinae on the propodeum and the shape of the first tergite.

Since the above description was prepared Mr. Ries has forwarded five small males (which are not considered types), under Bureau of Entomology number Webster 18707, which are much darker than the types. These specimens are piceous, with most of the head and thorax above almost black. The number of joints in the antenna varies from 24 to 26. These small males were reared in the autumn of 1924 and come from the following localities in New York: Byron (Cage No. 4083), East Bethany (Cage No. 4084), Sodus (Cage No. 4109) and Neufield (Cage No. 4058).

Heterospilus etiellae, new species

Female.—Length, 2.5 mm. Length of ovipositor, 1 mm. Head, seen from above with the orbits gently receding; posterior orbits about half the width of the eye; face finely granular; frons to the level of the anterior ocellus granular; vertex with transverse wrinkles on a granular surface; posterior orbits shining below, dorsally sculptured like the vertex but not so strongly; antenna 24-jointed, the third and fourth joints subequal; scutum coarsely granular; notauli distinctly foveolate anteriorly; posterior portion of the prescutum reticulate; suture in front of the scutellum with three longitudinal rugae; disc of the scutellum laminate; dorsal aspect of the propodeum granulato-reticulate, the posterior face of the propodeum reticulate; dorsal aspect of the propodeum with a median longitudinal carina which joins the pentagonal area of the posterior face; mesepisternum smooth except medianly, where it is finely laminate; first tergite shorter than the second, striato-punctate with the striations predominating; second tergite with three transverse depressions, the first line-like, the two following broad, shallow, the surface longitudinally rugulose; third and following tergites smooth; ovipositor half the length of the abdomen; first and second abscissae of the radius subequal; recurrent vein interstitial. Ferruginous; dorsal aspect of the propodeum, base of the first tergite piceous; palpi, mouth parts and legs testaceous; flagellum black; wings hyaline; venation pale brown; parastigma dark brown, very sparsely clothed with glistening white hairs.

Paratype females show very little variation. The dark color of the propodeum extends on the side in some and the antennae vary from 22 to 24 joints.

Male.—Length, 2 mm. Antenna 23-jointed. The above description

of the female applies equally well to the male. The pseudostigma in the hind wing is large and unusually well developed.

Paratype male is rufo-piceous, but the dark areas can be distinguished by their black color; otherwise it agrees with the allotype.

Type locality.—Porto Rico.

Described from 19 females (one type) and two males (one allotype) reared from the larva of *Etiella zinckenella* Treitschke in the pods of chick pea intercepted at quarantine in New York City. Material collected by Ivan Shiller June 18, 1923, and recorded under New York No. 1912.

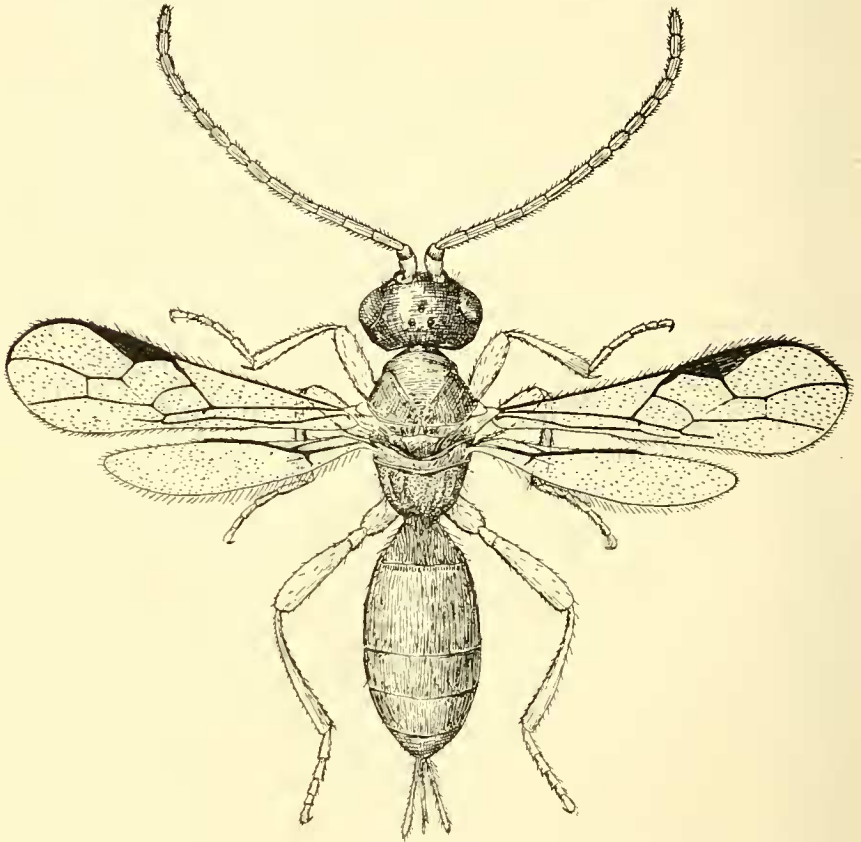


Fig. 1.—*Heterospilus zeteki*, new species. Adult female. (Drawn by E. T. Armstrong.)

Type.—Cat. no. 26599, U. S. N. M.

This new form is more like *Heterospilus longicaudis* Ashmead than any other species from the West Indies. It may readily be separated from *longicaudis* by the shorter ovipositor and by the presence of ridges on the propodeum.

***Heterospilus zeteki*, new species (Fig. 1)**

Female.—Length, 1.5 mm.; length of ovipositor, 0.33 mm. Head when seen from above strongly narrowing behind the eyes; width of the posterior

orbits subequal with the width of the eyes; face coriaceous; frons, vertex, and orbits smooth and polished; antenna 16-jointed, the joints long and nearly of uniform length, third and fourth subequal; scutum polished; notauli simple; depressed area on the posterior portion of the prescutum irregularly wrinkled; suture in front of the scutellum finely granular at the bottom; propodeum reticulate, without a carina, the lateral-basal areas granular; mesepisternum polished; first tergite raised medianly, without predominating striae, the surface with longitudinal striae which are better defined immediately laterad of the raised area; second and following tergites smooth, polished; ovipositor about one-third the length of the abdomen; first and second abscissae of the radius subequal; recurrent vein nearly interstitial. Dark piceous; scape, four anterior legs, except the femora dorsally, the posterior tibiae and tarsi, posterior femora beneath, and the posterior trochanters testaceous; mouth parts and inner orbits rufopiceous thorax with sparse, long gray hairs; wings hyaline; venation dark brown.

Paratype female differs from the type in having the narrow base of the second tergite finely striated.

Male.—Length, 1.25 mm. Antenna 17-jointed. Agrees with the description of the female except the base of the propodeum is not reticulate, the sculpture of the face is not so coarse, and the head between the eyes at the level of the antennae is rufo-piceous.

Paratype male has the antenna 15-jointed, otherwise agrees with the allotype.

Type locality.—Barro Colorado Island, Canal Zone, Panama.

Described from two females (one type) and two males (one allotype) collected August 22, 1923, from the nest of *Nasutitermes ephratae* Holmgren. Material collected by J. Zetek and forwarded to T. E. Snyder under Zetek No. 2210.

Type.—Cat. no. 26598, U. S. N. M.

In the smooth sculpture of the thorax and abdomen this species is rather unusual, and may easily be distinguished from the other Neotropical forms by these characters and its general dark color.

***Heterospilus melanocephalus*, new species**

Female.—Length, 2 mm. Length of ovipositor beyond end of abdomen, 0.75 mm. Head subquadrate, temples broad; face rather coarsely coriaceous; frons shining, indistinctly tessellate medianly; vertex with irregular, transverse aciculation immediately above the ocelli; antennae 20-jointed, the joints long and well defined, third joint slightly longer than the fourth; scutum granular, subopaque; notauli feeble; suture in front of scutellum with a few well defined rugae; propodeum sub-shining, areola large, reticulate; basal-lateral areas finely punctate; mesepisternum smooth, polished except the upper anterior angle which is coriaceous; sternauli well defined, coriaceous; sides of the propodeum reticulate; first intercubitus obsolete except for a small stump at the radius; radius leaving stigma beyond the middle, its first abscissa two-thirds the length of the second; abdomen short, apical width of the first tergite much greater than its length; first and base of second tergite longitudinally striate; first tergite has two predominating striae which form a raised wedged-shaped area medianly; second tergite without impressed lines; apex of second and all of the following tergites polished; ovipositor two-thirds of length of abdomen. Testaceous; head

black; scape and basal half of flagellum ferruginous, rest of flagellum piceous; wings hyaline iridescent; venation pale brown.

One of the paratypes has the antennae 18-jointed, and the transverse aciculation on the vertex are very feeble.

Type locality.—Uvalde, Texas.

Described from four females reared in June, 1921, by J. C. Hamlin, and thought by him to be a parasite of *Melitaria junctolineella*, and from one specimen from the same locality which Mr. Hamlin thought was a parasite of *Cornifrons elautalis*.

Type and three paratypes.—Cat. no. 25624, U. S. N. M. Single paratype returned to the collector.

Runs in Ashmead's key¹ to *hylotrupidis* Ashmead; but it differs in the black head, shorter first tergite, etc.

PROCEEDINGS OF THE ACADEMY AND AFFILIATED SOCIETIES

THE GEOLOGICAL SOCIETY

395th MEETING

The 395th meeting of the Geological Society was held at the Cosmos Club November 12, 1924, President WRIGHT presiding and 89 persons present. The secretary announced the resignations of ADOLPH KNOPF and ESPER S. LARSEN and the death of THOMAS L. WATSON, State Geologist of Virginia, a corresponding member. The secretary also announced the result of a letter ballot on the place of meeting for the society as follows: Cosmos Club, 73; Interior Building, 14; No choice, 3.

Program: G. R. MANSFIELD: *Physiography of southeastern Idaho*. In southeastern Idaho the highest ridgetops at elevations of about 9,000 feet probably represent remnants of a peneplain developed in a region of complexly folded and faulted sedimentary rocks. The peneplain was dissected, and after the excavation of broad and deep valleys which, with the lower neighboring uplands, were extensively aggraded, the region was uplifted, and again subjected to erosion through several succeeding partial cycles. About 1,000 feet below the peneplain stand remnants of a late mature erosion surface, about which unreduced remnants of the earlier dissected peneplain or of an intervening erosion surface now rise in some places as high as 500 feet. Two later erosion surfaces stand at altitudes respectively about 300 and 600 feet lower. These form more or less well defined rock terraces above the present early mature canyons, which themselves range in depth from a few hundred to 1,000 feet or more. Older valleys, representing some of these earlier erosion surfaces, now hang here and there 400 feet or more above the present valley bottoms.

Some of the broader valleys or intermont basins have been reexcavated in the buried valleys, which succeeded the peneplain. Others are in part of structural origin or have been eroded in rocks with favorable structures. Still other valleys owe their transverse courses to superposition, succeeding the aggradational cycle which came after the peneplain. All have been aggraded to a greater or less extent, partly because of former arid climatic conditions and partly because of obstruction by basaltic flows in the lower

¹ Can. Ent. 25: 74. 1893.